Response Under 37 CFR 1.116
Expedited Procedure
Examining Group 1700
Application No. 10/001,573
Paper Dated September 9, 2004
Attorney Docket No. 128346.31801

REMARKS

The present amendments and the following remarks are believed to render the claims at issue patentable. The Applicant maintains that the present claim amendments do not present new issues after Final Rejection, but that the claim amendments combine elements previously reviewed by the Examiner. Applicant therefore asks that the Examiner reconsider the amended elements and enter the amendments at this time.

The Applicant maintains that there is patentable subject matter in the present combination of claim limitations. None of the references cited by the Examiner teach or suggest a method of improving the toughness of a CBN product through the use of a specific combination of catalyst and oxygen getter.

Specifically, the Applicant has added limitations to Claim 1, so that the high temperature/high pressure process is conducted in the presence of a catalyst ***and*** an oxygen getter. The oxygen getter is selected from titanium, aluminum, silicon and mixtures thereof and the amount of oxygen getter in the blend is between about 0.005 and 0.5 wt %.

Applicant has amended Claim 23, wherein the oxygen getter comprises titanium, to include the presence of a catalyst and to include the amount of oxygen getter being between about 0.005 and 0.5 wt %. Claim 15 has been amended to depend from claim 1.

Claim Rejections Under 35 U.S.C. § 102(b) / §103(a)

The Examiner has rejected claims 1, 2, 8, 9, 11, 15, 20-24 and 26-28 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over French Patent No. 2686101 (the "French Patent"). Claims 3, 18 and 25 are rejected under 35 U.S.C. § 103(a) as obvious over the French Patent. Applicants respectfully request reconsideration of this rejection.

In maintaining his rejection over the French Patent, the Examiner relies heavily on the inherency doctrine. Under the inherency doctrine, the express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. §§ 102 or 103. However, the fact that a certain result or characteristic ***may*** occur or be present in the prior art is not sufficient to establish the inherency of that result or

characteristic.[1] "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'"[2] Inherency may not be established by probabilities or possibilities.

Here, it appears that while French Patent discloses a method which uses of a catalyst and an additive element of Al, B, Si, Zr or Ti, this method does not disclose the presently claimed percentage of reactants in the process of forming and improving the toughness of the low oxygen CBN. Therefore, since the amount of oxygen getter is not disclosed, the French Patent does not make clear that the resulting CBN crystals would ***inherently*** have improved toughness and low oxygen content as presently claimed. Since each and every process step of the present claims is not taught by the French Patent, the resulting product of the French Patent ***does not*** inherently possess all the claimed properties of the CBN product. The French Patent does not teach each and every limitation of the presently claimed processes, therefore, the inherency doctrine does not apply.

Additionally, the process taught by the French Patent does not render the presently claimed processes obvious. The "additive" of the French Patent is added to the catalyst and is linked to reaction yield. It is nowhere disclosed, suggested or implied that the "additive" of the French Patent is an oxygen getter in the amount of 0.005 to 0.5 wt% which is crucial for the resulting CBN product to have low oxygen content and improved toughness. One skilled in the art would ***only*** recognize that the presently claimed process would produce an improved toughness and low oxygen content CBN product from a reading of the present application, not from a reading of the French Patent.

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[1] *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981).

[2] *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

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Claim Rejections Under 35 U.S.C. § 102(b) / §103(a)

The Examiner has rejected claims 1-3, 8, 9, 11, 15 and 19-28 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over British Patent No. 2058840 (the "British Patent"). Applicants respectfully request reconsideration of this rejection.

The British Patent discloses a process for the production of *polycrystalline* CBN compacts, which is a process to produce monolithic solids, not single cBN crystals, as in the present claims. This reference does not describe the presently claimed catalyst nor the use of any oxygen getter. The British Patent is silent about and does not teach or suggest, any method conditions that would result in a CBN product that has improved toughness properties and an oxygen content of less than 300 ppm. Instead, it uses different materials in a different process to produce a different product.

Claim Rejections Under 35 U.S.C. § 102(b) / §103(a)

The Examiner has rejected claims 1-3, 8, 9, 11, 15 and 19-22 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Japanese Patent No. 358060604 (the "Japanese Patent"). Applicants respectfully request reconsideration of this rejection.

The Japanese Patent discloses that a catalyst of Si, Al, Li, Mg, Ca, and nitrides thereof may be used in an amount of 2 to 15 parts by weight of the hBN in order to produce CBN. It is maintained however that this reference is silent as to the presence of a catalyst **and** an oxygen getter, wherein the oxygen getter is between about 0.005 and 0.5 wt %. This reference teaches the presence and percentage of a catalyst alone. Therefore, it is silent as to the use of an oxygen getter and the percentage of oxygen getter necessary to result in CBN having improved toughness and low oxygen content. There are specifically claimed elements in the present independent claims that are not taught in the Japanese Patent. Also, there is no motivation or suggestion of the presently claimed oxygen getter. Therefore, this reference is neither appropriate as a Section 102 or a Section 103 reference.

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Claim Rejections Under 35 U.S.C. § 102(b) / §103(a)

The Examiner has rejected claims 1, 8, 9, 11, 15, 21 and 22 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over the Article by *Sato* et al. The Examiner has rejected claims 3 and 19 under 35 U.S.C. § 103(a) as obvious over the *Sato* article. Applicants respectfully request reconsideration of this rejection.

The *Sato* Article teaches a process to produce CBN that uses magnesium nitride as a catalyst and optionally, Zr powder (to increase yield). This reference is silent as to a process that uses both a catalyst and an oxygen getter comprising titanium, silicon, aluminum and mixtures thereof. Accordingly, this reference is silent as to the percentage of an oxygen getter necessary to produce a CBN product with improved toughness and low oxygen content. There are specifically claimed elements in the present independent claims that are not taught in the *Sato* article. Also, there is no motivation or suggestion of an oxygen getter comprising titanium, silicon, aluminum, wherein the oxygen getter is between about 0.005 and 0.5 wt %. Therefore, this reference is not appropriate as either a Section 102 or a Section 103 reference.

Claim Rejections Under 35 U.S.C. § 102(b) / §103(a)

The Examiner has rejected claims 1-3, 8, 9, 11, 15 and 19-22 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Taylor el al., U.S. Patent No. 3,768,972 (the '972 patent). Applicants respectfully request reconsideration of this rejection.

The '972 Patent discloses a method for converting a boron nitride from the hexagonal to the cubic form at high temperatures and pressures in the presence of aluminum at a concentration of 0.5 to 5.0 wt%. It is maintained, however, that this reference is silent as to the presence of a catalyst **and** an oxygen getter, wherein the oxygen getter is between about 0.005 and 0.5 wt %. This reference teaches the presence and percentage of a catalyst alone. Therefore, it is silent as to the use of an oxygen getter and the percentage of oxygen getter necessary to result in CBN having improved toughness and low oxygen content.

There are specifically claimed elements in the present independent claims that are not taught in the '972 Patent. Also, there is no motivation or suggestion of the presently claimed oxygen getter. Therefore, this reference is neither appropriate as a Section 102 or a Section 103 reference.

Claim Rejections Under 35 U.S.C. § 102(b) / §103(a)

The Examiner has rejected claims 1-3, 8, 9, 11, 15 and 19-22 under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Shioi el al., U.S. Patent No. 6,508,996 (the '996 patent). Applicants respectfully request reconsideration of the Examiner's rejection.

In maintaining his rejection over the '996 Patent, the Examiner relies heavily on the inherency doctrine. The fact that a certain result or characteristic ***may*** occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.[3]

While the '996 Patent discloses a method which uses a catalyst system comprising: (1) amides, imides and carbides of alkali metals and alkaline earth metals and (2) either Si and B, this method does not disclose the presently claimed percentage of catalyst, oxygen getter and CBN product-forming feedstock in the process of forming an improved toughness and low oxygen CBN.

The '996 Patent teaches in column 2, lines 11-15 that "[s]ince oxygen impurities contaminated in the form of boron oxide or the like may retard conversion of the hexagonal boron nitride to cubic boron nitride, the starting materials with a less oxygen content are desired." Therefore, the '996 Patent mentions oxygen concentration in relation to the starting material, hexagonal boron nitride (hBN), but not in relation to the CBN product. This reference uses low oxygen source of hBN to increase yield, it is not using a method of "gettering" as is presently claimed to improve CBN crystal roughness.

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[3] *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981).

It is maintained that the '996 Patent does not teach a "getter" but instead teaches a specific catalyst system. There is no teaching as to the use of Si, Ti and Al as oxygen getters. The use of a catalyst and a specifically claimed getter may not be extrapolated from this teaching. The catalyst system of the '996 Patent teaches that Si may be present in an amount of 0.0001 to 0.008 wt% of the "blend" (the blend being both hBN and Si). See Column 3, line 66 to Column 4, line 5, converting parts to wt %. Therefore, this is a smaller and different range than the presently claimed range of oxygen getters. The '996 patent is silent as towards the use of Ti and Al. Therefore, since the amount of an oxygen getter is not disclosed, the '996 Patent does not make clear that the resulting CBN crystals would ***inherently*** have improved toughness and low oxygen content as presently claimed. Since each and every process step of the present claims is not taught by the '996 Patent, the resulting product of the '996 Patent ***does not*** inherently possess all the claimed properties of the CBN product.

Additionally, the process taught by the '996 Patent does not render the presently claimed processes obvious. The Si or B sources of the '996 Patent is added to the catalyst and is linked to reaction yield. It is nowhere disclosed, suggested or implied that the presently claimed oxygen getter in the amount of 0.005 to 0.5 wt% is crucial for the resulting CBN product to have low oxygen content and improved toughness. One skilled in the art would ***only*** recognize that the presently claimed process would produce an improved toughness and low oxygen content CBN product from a reading of the present application. No relationship between CBN product toughness and oxygen concentration is taught or suggested in the '996 Patent.

CONCLUSION

In light of the above amendments and remarks, Applicants respectfully submit that all pending claims as currently presented are in condition for allowance. Applicants respectfully request the Examiner to pass the case to issue at the earliest convenience.

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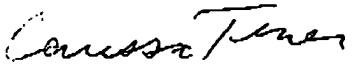
The Commissioner is hereby authorized to charge any additional fees which may be required for this submission, or credit any overpayment, to deposit account no. 50-0436.

Respectfully submitted,
PEPPER HAMILTON LLP



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Source	**catalyst**	**% of catalyst**	**% of oxygen getter**	**oxygen getter**	**Oxygen content**	**Crystal toughness**
Claim 1	catalyst		0.005 to 0.5 wt%	oxygen getter comprising Ti, Al and Si	less than 300 ppm	improved toughness: both TI and TTI higher
Claim 23	catalyst		0.005 to 0.5 wt%	oxygen getter comprising Ti	less than 300 ppm	improved toughness: both TI and TTI higher
French	catalyst containing at least one alkali or alkaline-earth metal nitride			additive element - Al, B, Si, Zr and Ti		
British **(Production of PCBN)**	refractory comp - transition metal nitride	0.1 to 30 wt %				
Japanese	Si, Al, Li, Mg, Ca, and nitrides thereof	0.5 to 0.15 wt %				
Sato Article	Mg_3N_2			oxygen getter - Zr		
US Patent 3,768,972 Taylor	Al and alloys of Al and Ni	0.5 to 5.0 wt %				
US Patent 6,508,996 *Shioi* et al.	amides, imides and carbides of alkali metals and alkaline earth metals		Si - 0.0001 to 0.008 wt % and B - 0.0005 to 0.15 wt %	Si or B source	NO data – low oxygen hBN as starting material linked to yield	Not as improved as present cBN crystals